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BRANCHIOBELLEID WORMS (ANNELIDA) FROM MICHIGAN CRAWFISHES

By MAX M. ELLIS

Through the courtesy of the Michigan Fish Commission the writer visited several islands in Potagannissing Bay and Lake Huron on Patrol Boat No. 4, Captain Robert E. Ellsworth commanding, during August, 1917. The branchiobdellid worms listed below were taken from crawfishes collected on this trip and from those of two additional collections made by Captain Ellsworth. Dr. Walter Faxon of Harvard University kindly identified the crawfish hosts.

The four species of branchiobdellids represented may be distinguished by the following key.

- a. Anterior nephridia opening to the outside through two separate pores in segment III; segments VIII and IX each bearing a pair of glandular disks on the ventral surface; dental formula usually 5-4 or 5-5, the middle tooth of each jaw being the longest tooth in the jaw.

Xironodrillus formosus Ellis in ed.

- aa. Anterior nephridia opening to the outside through one common pore in the dorsal surface of segment III.

- b. Body segments without conspicuously elevated portions; accessory sperm tube present.

- c. Upper and lower lips entire excepting a small, median emargination; dental formula 5-4, teeth approaching a subequal condition, although the middle tooth of the upper jaw is distinctly longer than the other four teeth of that jaw.

Cambarincola vitrea Ellis in ed.

- cc. Upper lip composed of four, subequal lobes, which can be extended as digitiform processes; lower lip composed of two, subequal lobes which can be extended; a small, lateral lobe on each side at the junction of the upper and lower lips; dental formula 5-4; middle tooth of upper jaw long and prominent; lateral teeth small, not more than half the length of the middle tooth.

Cambarincola philadelphica (Leidy)

- bb. Dorsal portions of segments elevated; segments VII and VIII with funnel-shaped enlargements of the dorsal portions of the segment, more or less completely encircling the segment; funnel of segment VIII excavated dorsally so that its dorsal margin bears two, small "horns"; dental formula 5-4.

Pterodrillus durbini Ellis in ed.

(1) *XIRONODRILUS FORMOSUS* EllisFrom *Cambarus virilis* Hagen

1. James Island, Potagannissing Bay, August 4.
2. Three miles up Potagannissing River, Drummond Island, Potagannissing Bay, August 4.
3. Pilot Harbor, Sitgreaves Bay, north side of Drummond Island, Potagannissing Bay, August 6.
4. Little Cass Island, head of Detour Passage, August 6.
5. Churchville Point, head of Lake George, 46° 31' N., August 7.
6. Harbor Island, Potagannissing Bay, August 8.
7. Winona Slips, Bay City, Saginaw Bay, September (Capt. Ellsworth).

(2) *CAMBARINCOLA VITREA* EllisFrom *Cambarus virilis* Hagen

1. James Island, Potagannissing Bay, August 4.
2. Three miles up Potagannissing River, Drummond Island, Potagannissing Bay, August 4.

From *Cambarus propinquus* Girard

1. Sault Sainte Marie, St. Marys River, August 7.
2. Echo Lake, Grand Island, Lake Superior, August 17 (Capt. Ellsworth).

(3) *CAMBARINCOLA PHILADELPHIA* (Leidy)From *Cambarus virilis* Hagen

1. James Island, Potagannissing Bay, August 4.
2. Pilot Harbor, Sitgreaves Bay, north side of Drummond Island, Potagannissing Bay, August 6.
3. Little Cass Island, head of Detour Passage, August 6.
4. Harbor Island, Potagannissing Bay, August 8.

(4) *PTERODRILUS DURBINI* EllisFrom *Cambarus virilis* Hagen

1. James Island, Potagannissing Bay, August 4.
2. Three miles up Potagannissing River, Drummond Island, Potagannissing Bay, August 4.
3. Pilot Harbor, Sitgreaves Bay, north side of Drummond Island, Potagannissing Bay, August 6.
4. Little Cass Island, head of Detour Passage, August 6.
5. Churchville Point, head of Lake George, 46° 31' N., August 7.
6. Harbor Island, Potagannissing Bay, August 8.
7. Winona Slips, Bay City, Saginaw Bay, September (Capt. Ellsworth).

It may be seen from this list that *Xironodrilus formosus* Ellis and *Pterodrilus durbini* Ellis were found in every collection from

Cambarus virilis Hagen. In each case *Xironodrilus formosus* was the more abundant species, represented by hundreds of individuals. Comparatively few *Pterodrilus durbinii* were taken. The relative abundance of these two species may be considered as accurate for these collections as the living crawfish were dropped into the killing fluid as soon as caught, and all of the branchiobdellid worms carried by each crawfish preserved. The two species of *Cambarincola*, if found, were represented by a fair number of individuals. *Cambarincola vitrea* Ellis was the only species taken from *Cambarus propinquus* Girard in these collections. Both species of *Cambarincola* here represented however have been taken from specimens of *Cambarus propinquus* at Douglas Lake, Michigan.

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